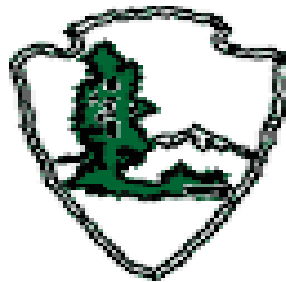




Unification &
Simplification
Through:

- Cooperation
- Innovation
- Opportunity



ACTIONABLE ENTERPRISE ARCHITECTURE

Presented By: Colleen Coggins,
DOI Chief Architect

July 14, 2004

AGENDA

- From Whence We Came
- DOI Enterprise Architecture Repository (DEAR)
- Actionable Modernization Blueprints
- Enterprise Architecture In Action:
 - **Recreation Blueprint Case Example**





OMB 2004 Budget Passback Language



Extracts From OMB FY 2004 Budget Passback:

- ▶ ***DOI has many separate and uncoordinated EA efforts underway.***
- ▶ ***The DOI is directed to create an integrated and comprehensive departmental process for EA;***
- ▶ ***Reduce redundancies in these separate approaches;***
- ▶ ***Map to the Federal Enterprise Architecture efforts of OMB.***
- ▶ ***EA developed to a detail level that ensures the efficient management of Department IT resources,***





DOI Enterprise Architecture Repository (DEAR) Overview

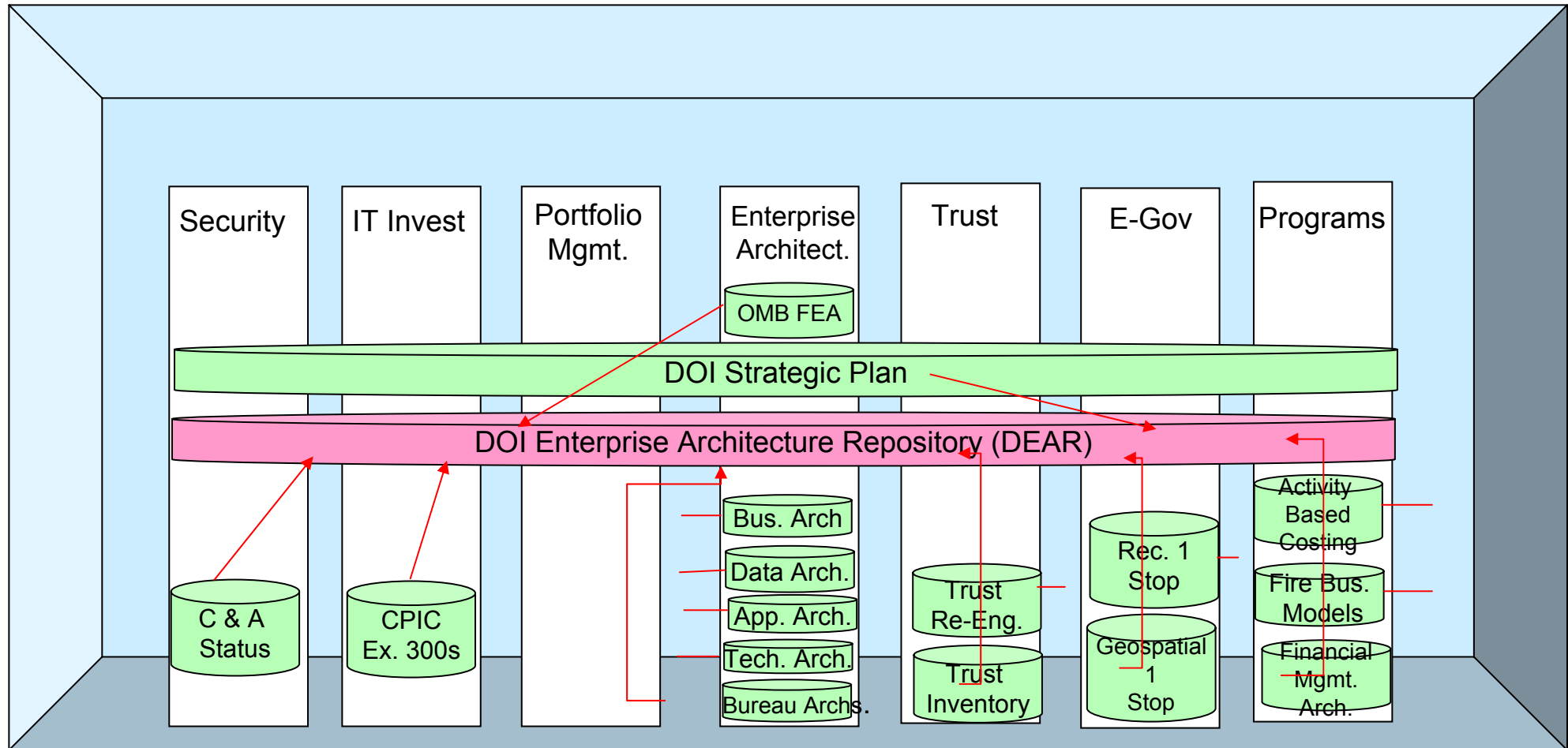


DOI Enterprise Architecture Repository (DEAR)

- ▶ **Unifies EA Development Across DOI.**
- ▶ **Decision Support Tool to develop Modernization Blueprints for Interior Lines of Businesses:**
 - **Identifies Data Sharing Opportunities**
 - **Identifies Systems with Functional & Data Overlaps**
 - **Identifies Gaps in Existing Capabilities for Achieving Strategic Objectives.**
- ▶ **Other Federal Agencies Investigating Use of DOI Meta-model**
 - **Department of Energy**
 - **Department of State**



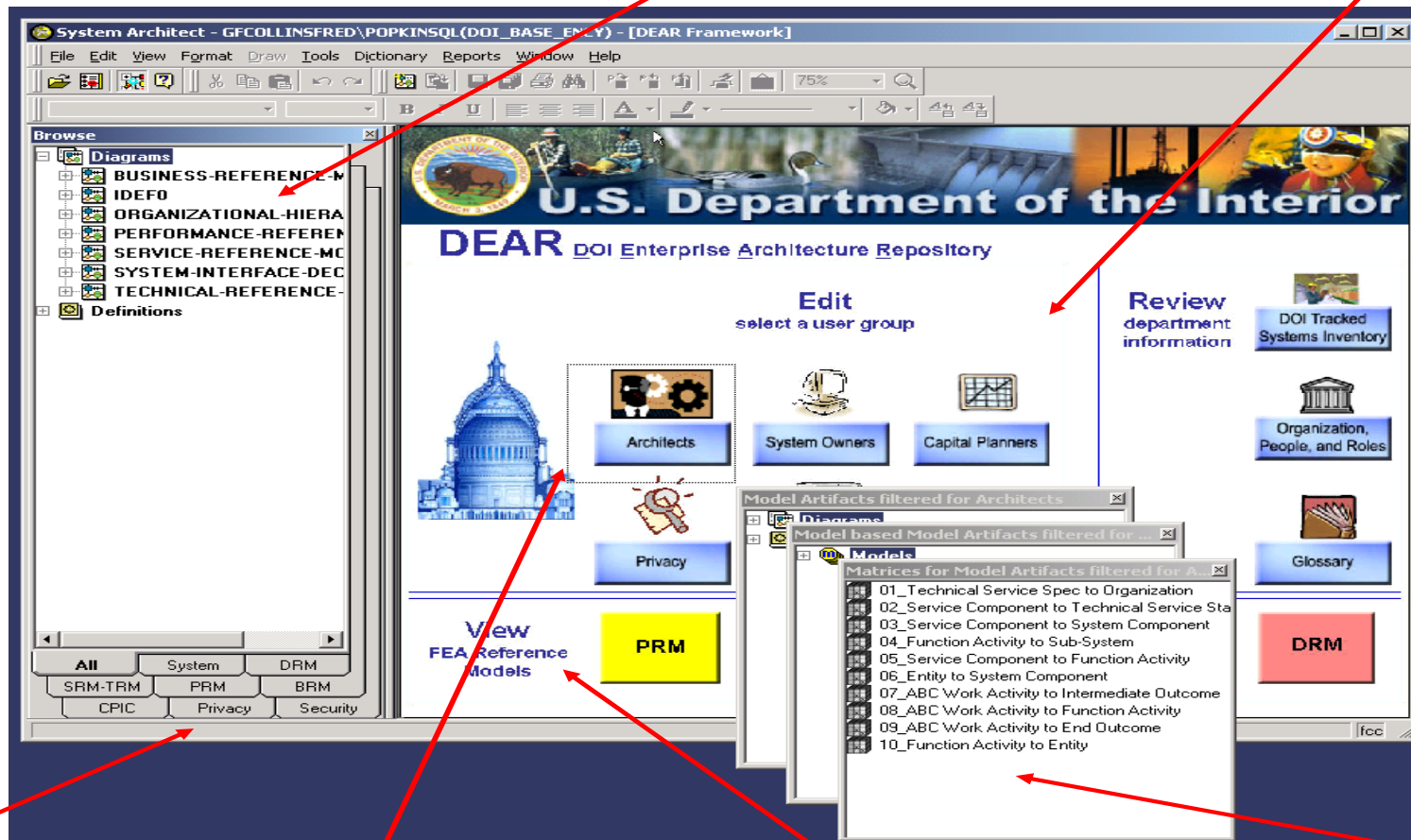
DEAR integrates data across the DOI to Improve Overall Business & IT Decision Making.



DEAR is a tailored COTS modeling and EA Repository tool (Popkin SA)

User-Defined Diagrams

Custom Framework



Custom Tabs

Stakeholder Views

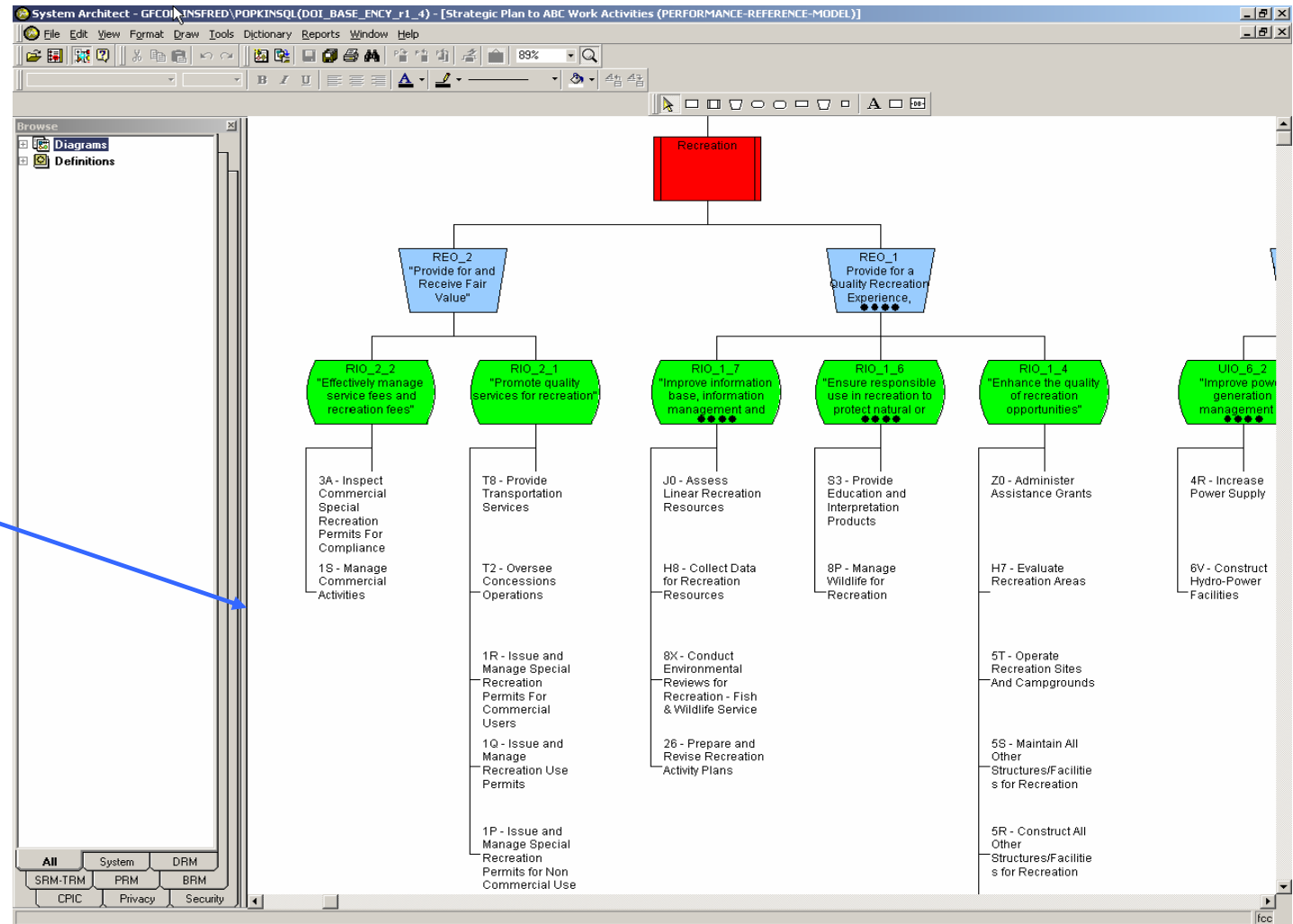
FEA Model Views

Custom Matrices



DOI Performance Reference Model in DEAR

DOI Strategic Plan is modeled in DEAR



DOI Business Reference Model in DEAR (Service to Citizens)

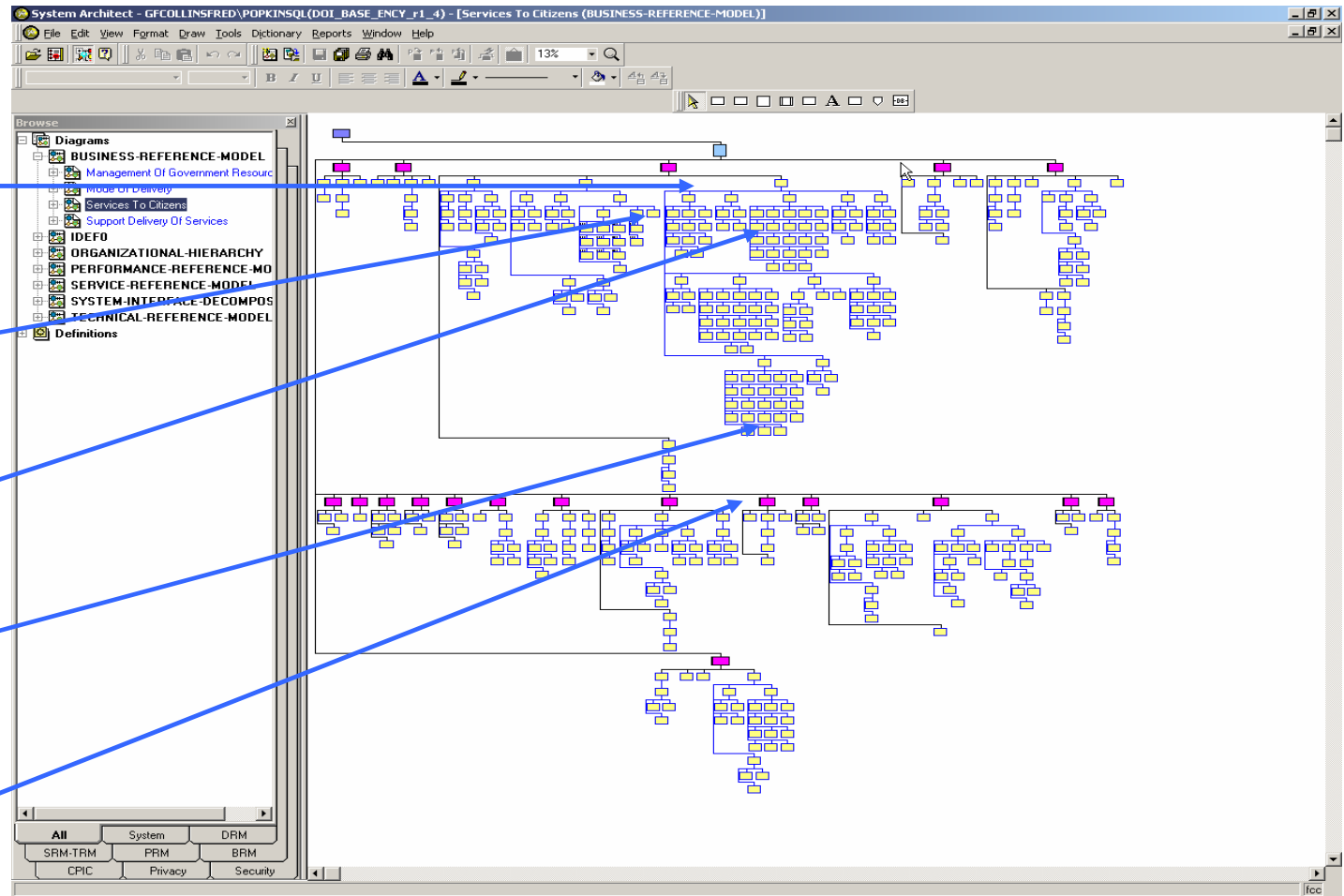
Business Area

Line of Business

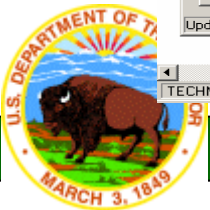
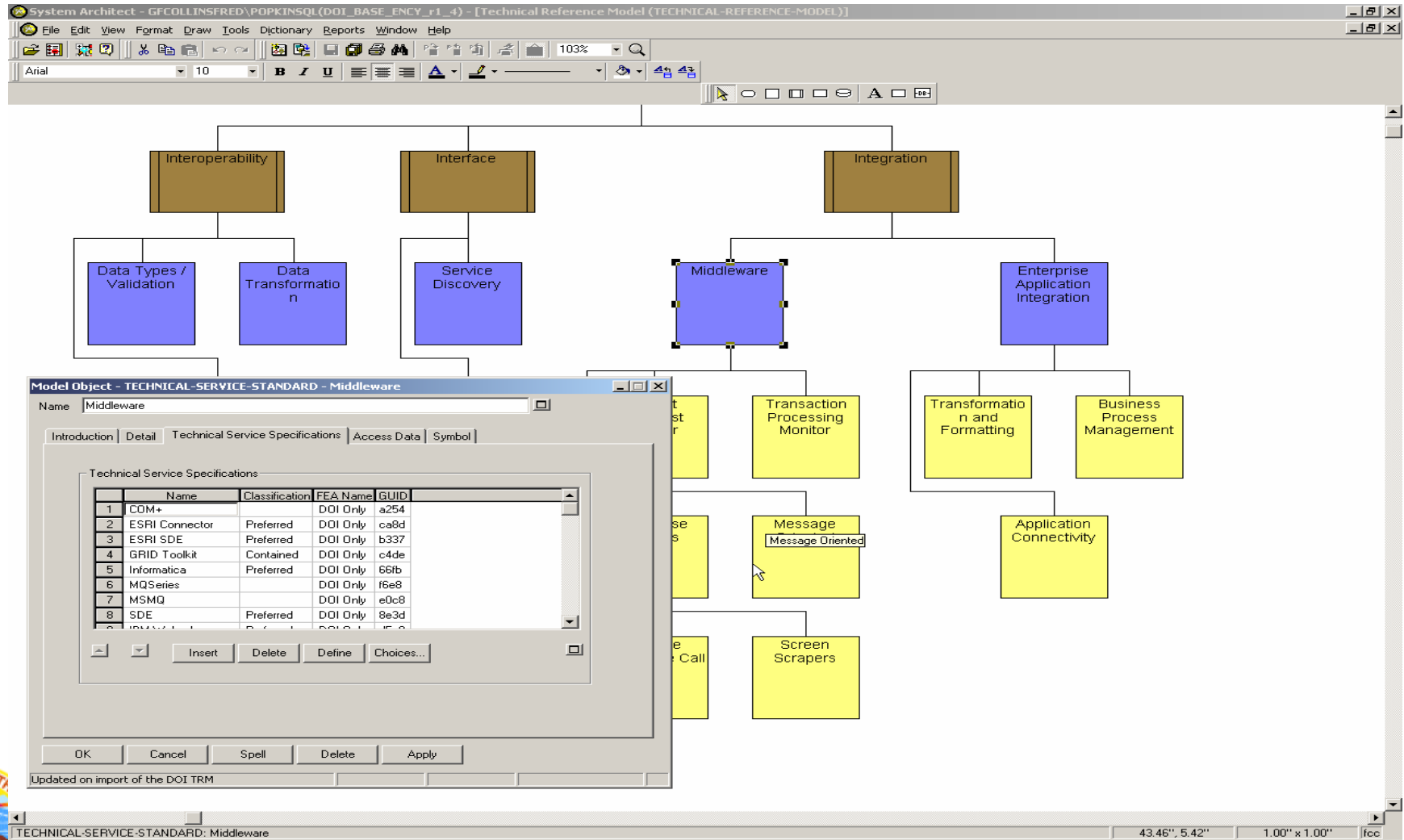
Sub Function

Function Activity
(4)

Function Activity
(5)



DOI Technical Reference Model in DEAR





Actionable Modernization Blueprints



DOI MODERNIZATION BLUEPRINTS

► In FY-04, the following Modernization Blueprints Will be Developed:

- Recreation
- Law Enforcement
- Financial Management
- Wildland Fire Management
- Indian Trust Management

IRB sets Priorities
for Future
Modernization
Blueprints



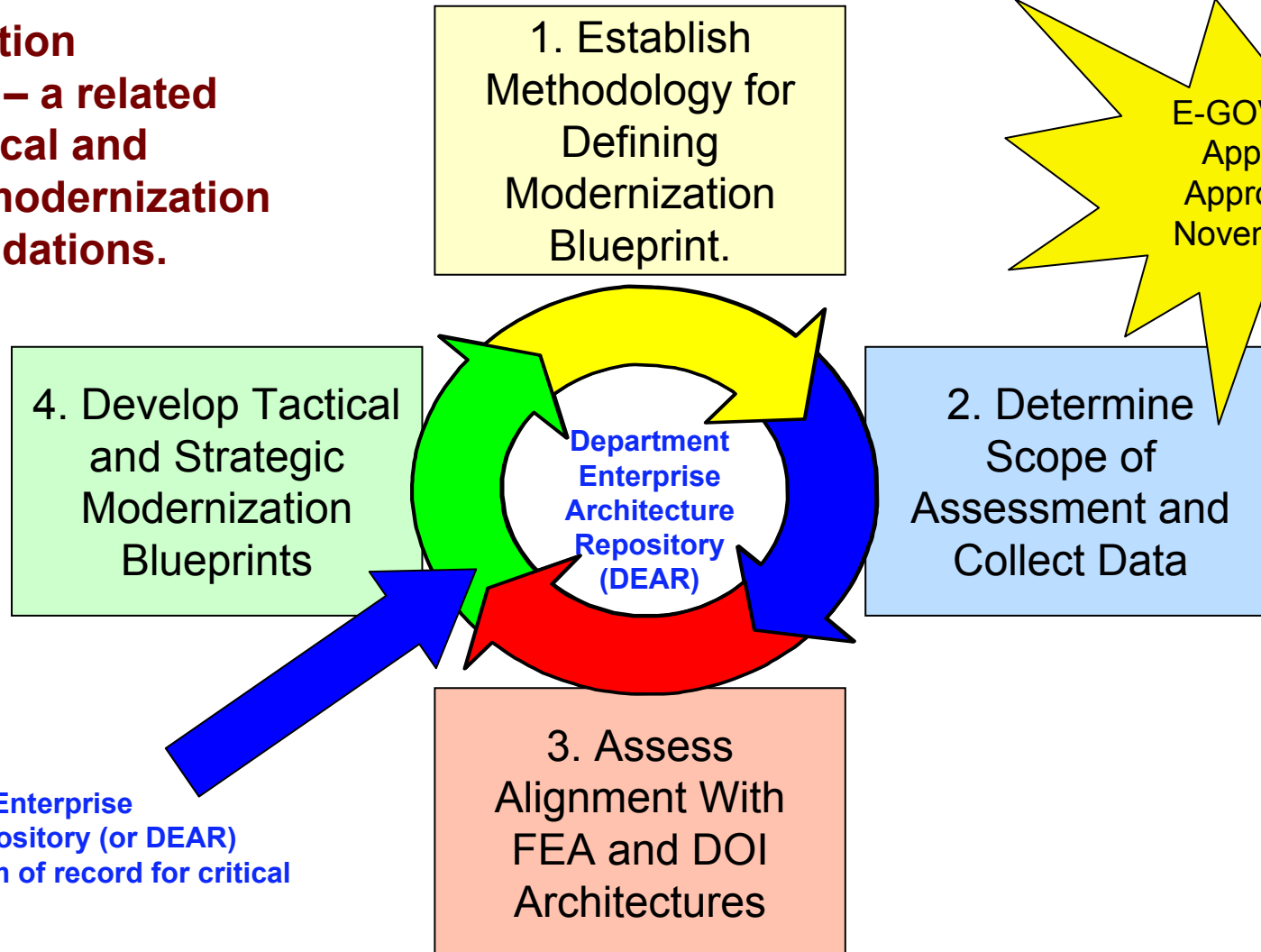
How is DOI's EA Approach Actionable?

- **Evaluates system capabilities for supporting DOI strategic goals and objectives**
Evaluate against end and intermediate strategic outcomes and measures
- **Which systems are old and/or costly to maintain?**
- **Opportunities to tie systems together more effectively.**
Identify systems that need to talk but don't
- **Opportunities to centralize information assets.**
- ▶ **Deliver short and longer-term recommendations that can be acted upon:**
 - **Which systems would need to be consolidated.**
 - **Which systems would benefit from shared services (application & data).**
 - **Potential investment proposals that may need to be considered now.**
 - **Comprehensive views of how the IT systems support the lines of business.**



Take-Action Approach to Enterprise Architecture – Four Phases

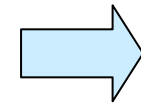
Modernization blueprints – a related set of tactical and strategic modernization recommendations.



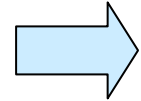
The Department Enterprise Architecture Repository (or DEAR) will be the system of record for critical EA information.



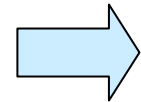
1. Establish Conceptual Vision of Target Architecture - Criteria



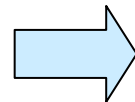
Business Assessment Criteria



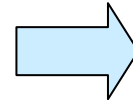
Data Assessment Criteria



Technology Assessment Criteria

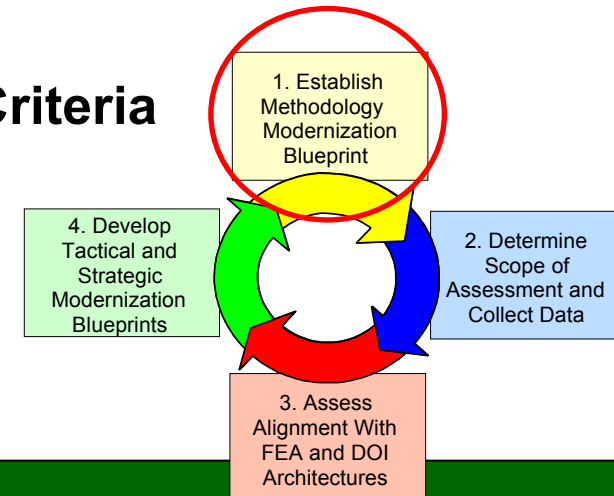


Security Assessment Criteria

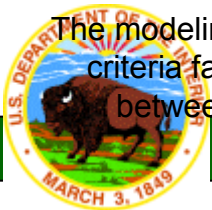
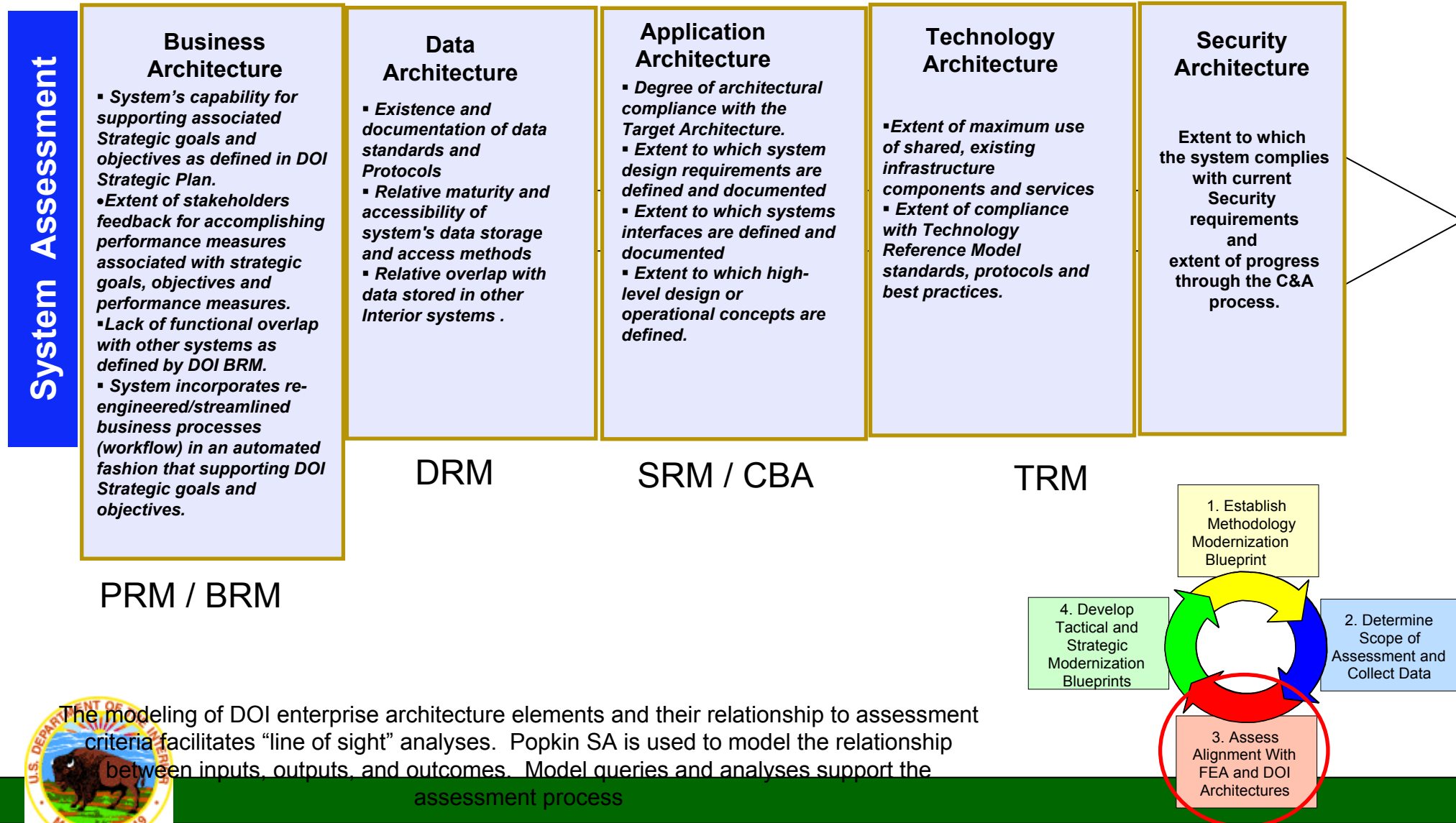


Application Assessment Criteria

The criteria is derived from IEA Conceptual Architecture Principles (CAP) & Common Requirements Vision (CRV) and is used to assess how well a system aligns with the target state.



3. Assess Alignment with FEA and DOI EA

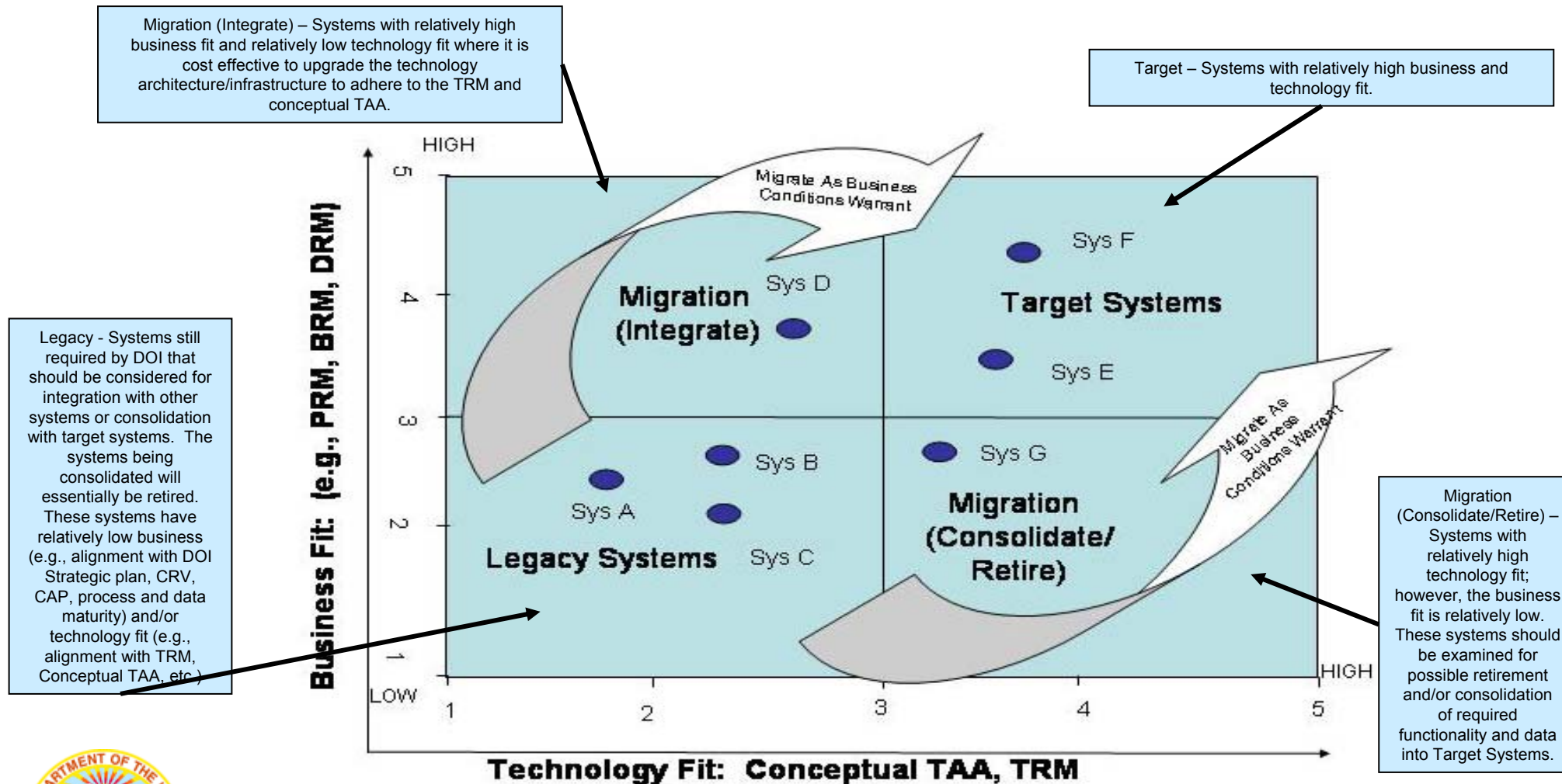


Investments and Systems within a LOB are Ranked & Scored Against Criteria.

Criteria	Description	Low (1)	Medium (3)	High (5)
P1	Business processes supported by the system.	Business processes automated are not defined.	Business processes automated are partial documented.	Business processes automated and stakeholders supported are clearly defined and documented.
P2	Extent of system support of DOI and BLM strategies, goals, and objectives.	No linkages between system functionality and DOI & BLM strategies and goals.	Some linkages between system functionality and DOI & BLM strategies and goals.	There is a direct link between the functionality provided by the system and DOI & BLM strategies and goals.
P3	Extent of stakeholders feedback for performance measurement and system refinement.	Customers? What customers? Who cares? Customers and users are never consulted as to their satisfaction with the system. No performance measurement.	System managers have a vague idea of who their customers might be (or used to be), guess about their needs and interests. Customers and users are occasionally consulted as to their satisfaction with the system. Minimal performance measures and system refinements.	Customer groups and individuals are clearly identified; their needs are documented; data collection and management systems are linked to those needs. Customers and users are regularly consulted as to their satisfaction with the system. Performance is measured continuously; feedback is used to refine the system.
P4	Lack of functional overlap with other systems.	Significant overlap between system functionality and available COTS, OOTS products, and other BLM systems.	Some overlap between system functionality and COTS, OOTS products, and other BLM systems TAA.	The functionality provided by the system does not significantly overlap with other BLM systems.
P5	Degree to which system training and support opportunities have been addressed.	No training, support, or documentation available; users have to study the code to figure out what the system does.	No comprehensive training materials available, but experienced users and some documentation exist to help a determined user navigate the system.	Training and information provided to employees and the public ensure data and information in Agency information systems are utilized to their full potential. User groups defined.
Criteria	Description	Low (1)	Medium (3)	High (5)
D1	Existence and documentation of data standards and protocols.	Data standards are not defined, or are in a constant state of flux. No documentation exists outside of personal files and notes of the system developers to implement QA/QC systems.	Data standards are defined, but redundancies exist within a given scale. Informal and ad hoc QA/QC systems. Some documentation exists, but it is not complete nor easily accessible.	Standardized data collection protocols and data standards are fully documented and easily accessible and utilized in all data collection procedures at suitable scales. QA/QC systems are fully operational.
D2	Relative maturity and accessibility of system's data storage and access methods.	Data stored and maintained in proprietary databases and/or unique formats, which preclude access or use by customers.	Information systems and data structures allow data entry and exit, but it is cumbersome for users to gain access and to extract information in a usable format.	Information systems and data structures provide employees and the public ready access to current economic, social, and ecological data and information using current technology.
D3	Relative data entity access or modification overlap with other systems.	Significant overlap with other systems in terms of data subject areas accessed. Many system data elements maintained are redundant with respect to other BLM systems.	Some overlap with other systems in terms of data subject areas accessed. Few system data elements maintained are redundant with respect to other BLM systems.	Minimal overlap with other systems in terms of data subject areas accessed. System data elements maintained are unique with respect to other BLM systems.
Criteria	Description	Low (1)	Medium (3)	High (5)
A1	Degree of architectural compliance with the conceptual Target Application Architecture.	The system is not in alignment with the conceptual TAA. No plans have been established to bring the system into closer alignment with the TAA.	The system and its development plan are partially aligned with the BLM's TAA. Plans have been established to bring the system back into alignment.	The system and its development plan are aligned with the BLM's Target system Architecture.
A2	Extent to which system design requirements are defined and documented.	System availability, bandwidth, performance, and functional requirements are undefined and undocumented. System requirements not aligned with business processes.	System availability, bandwidth, performance, and functional requirements are partially defined and documented. System requirements partially aligned with business processes.	System availability, bandwidth, performance, and functional requirements have been fully defined and documented and aligned with business processes.
A3	Extent to which systems interfaces are defined and documented.	System interfaces, APIs, and dependencies are not defined. Not aligned with TAA.	System interfaces, APIs, and dependencies are partially defined.	System interfaces, APIs, and dependencies are fully defined.
A4	Extent to which high-level design or operational concepts are defined.	No high-level design diagram or description. No operational concept documentation.	Some documentation exists, but it is not complete nor easily accessible.	High-level design and operational concept exists and is fully documented and accessible.

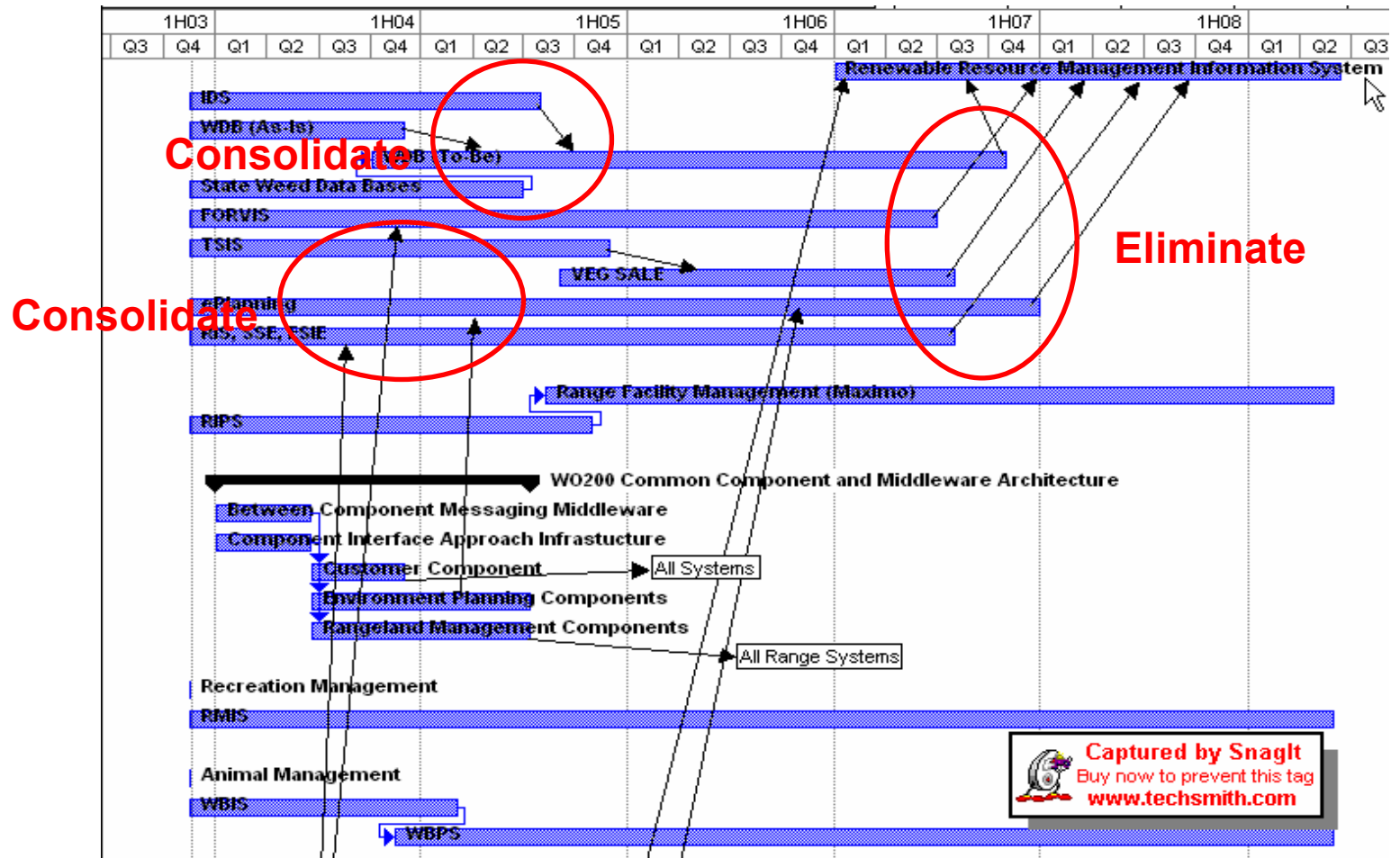
1	A	B	C	J	K	L	M	N	O	P	Q	R	S	T	U	Z	AA	AI	AJ	AK	AL	AM	AN	AO	
2	Click 1 or 3 times (valid, 3 or 3 times invalid)		Procs	Data TAA Criteria				Application TAA Criteria				Tech		The overall score is compiled from these three individual scores!											
3	Click on Hyperlinks to View Criteria Definitions and Rating Rationale		Process TAA Weighted Score (Scale of 1 to 9)	Data TAA Criteria Assessment Weight				Application TAA Criteria Assessment Weight				Tech TAA Weighted Score (Scale of 1 to 9)		This is the overall score for each system!											
4	Portfolio	System	D1	D2	D3	D4	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	Fit	Score	AVG/TAA	Fit	Score	AVG/TAA	Fit	Score	AVG/TAA
5	200	RIPS	1	FSA	2	1	1	1	1	2	2	2	1	1	1	1	1	2.00	1.25	1.63	5.87				
6	200	RAS	2	FSA	3	1	1	1	1	2.67	1	1	1	1	1	1	1	3.75	3.51	3.04	11.25				
7	200	RS	2	FSA	1	2	2	1	1	2.67	2	1	1	1	1	1	1	3.50	3.25	2.44	9.24				
8	200	JOS	2	FSA	2	1	1	1	1	1.67	2	1	1	1	1	1	1	4.25	2.66	1.66	4.56				
9	200	WOB (Ap-Is)	2	FSA	1	2	1	1	1	1.67	1	2	1	2	1	1	1	1.50	1.13	1.31	4.26				
10	200	WBS	2	FSA	3	3	3	1	1	3.00	2	2	2	2	1	1	1	2.25	2.31	2.28	7.56				
11	200	RMS	2	FSA	1	2	2	1	1	3.33	1	2	2	2	1	1	1	2.75	2.69	2.72	8.77				
12	200	TSIS	2	FSA	1	3	3	1	1	3.33	2	3	3	3	1	1	1	3.00	2.50	2.75	8.83				
13	200	FORVIS	2	FSA	2	3	3	1	1	2.67	1	2	1	2	1	1	1	1.50	1.88	1.69	6.04				
14	200	eGIS	10	FSA	FSA	FSA	FSA	1	1	FSA	FSA	FSA	FSA	FSA	1	1	1	FSA	FSA	FSA	FSA				
15	200	NSentHw	11	FSA	FSA	FSA	FSA	1	1	FSA	FSA	FSA	FSA	FSA	1	1	1	FSA	FSA	FSA	FSA				
16	200	EPS	12	FSA	FSA	FSA	FSA	1	1	FSA	FSA	FSA	FSA	FSA	1	1	1	FSA	FSA	FSA	FSA				
17	200	WOB	13	FSA	FSA	FSA	FSA	1	1	FSA	FSA	FSA	FSA	FSA	1	1	1	FSA	FSA	FSA	FSA				
18	200	WSPS	14	FSA	FSA	FSA	FSA	1	1	FSA	FSA	FSA	FSA	FSA	1	1	1	FSA	FSA	FSA	FSA				
19	200	WFIS	15	FSA	FSA	FSA	FSA	1	1	FSA	FSA	FSA	FSA	FSA	1	1	1	FSA	FSA	FSA	FSA				
20	200	ePlanning	16	FSA	FSA	FSA	FSA	1	1	FSA	FSA	FSA	FSA	FSA	1	1	1	FSA	FSA	FSA	FSA				

Systems within a LOB Portfolio are Grouped in Quadrants



Sequencing Plans are developed to Guide CPIC Process

Sequencing Plan should be based on Scheduled Target Deployment which drives Legacy System Integration and Consolidation Plans.



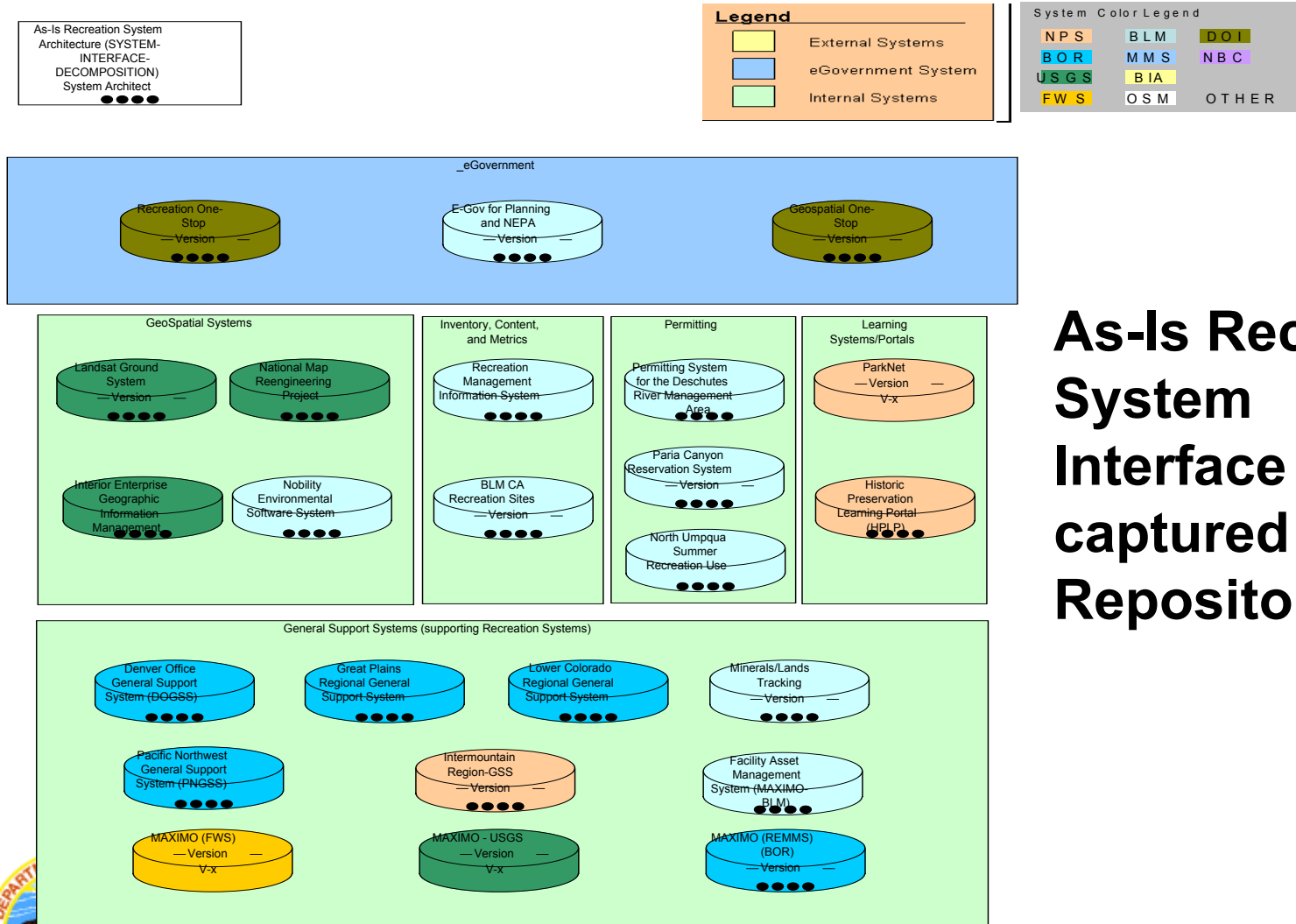


Recreation Modernization Blueprint

CASE EXAMPLE



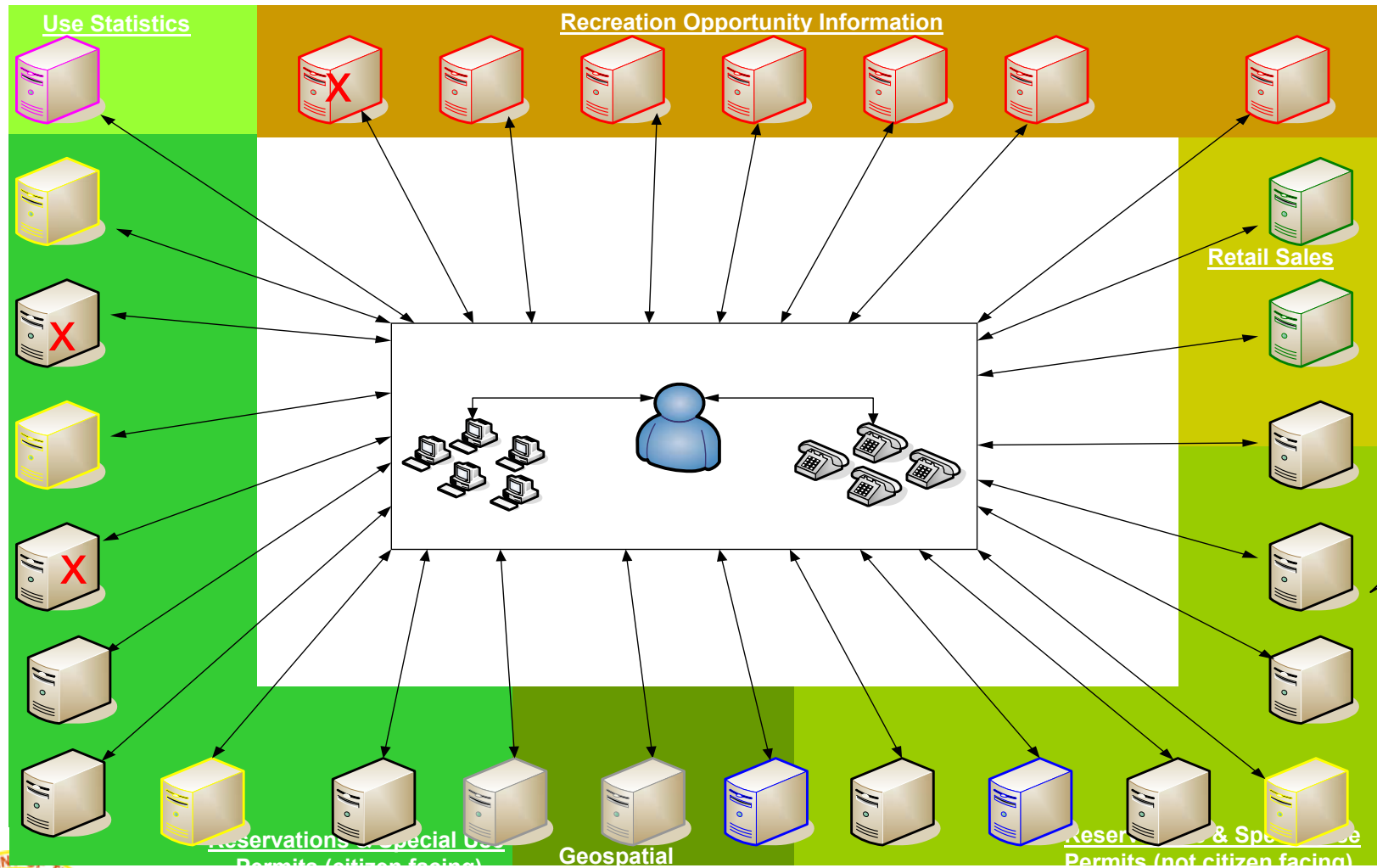
Recreation Systems and Investments are captured in DEAR



As-Is Recreation System Interface Model captured in DOI EA Repository (DEAR).



Current recreation customers are faced with too many sources for Federal recreation information.



Only 3 Systems currently slated for consolidation into R1S

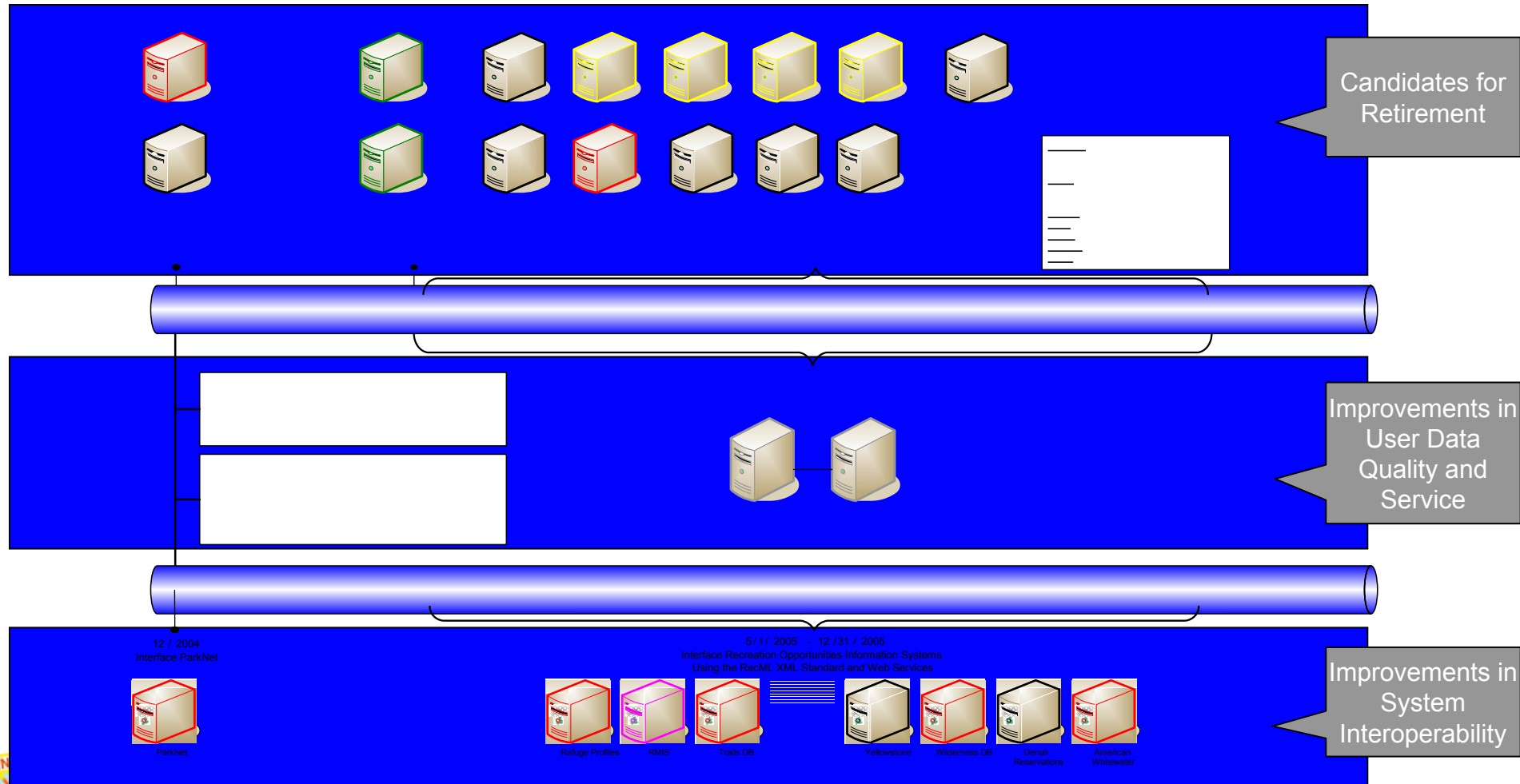
RMIS

Rec.gov

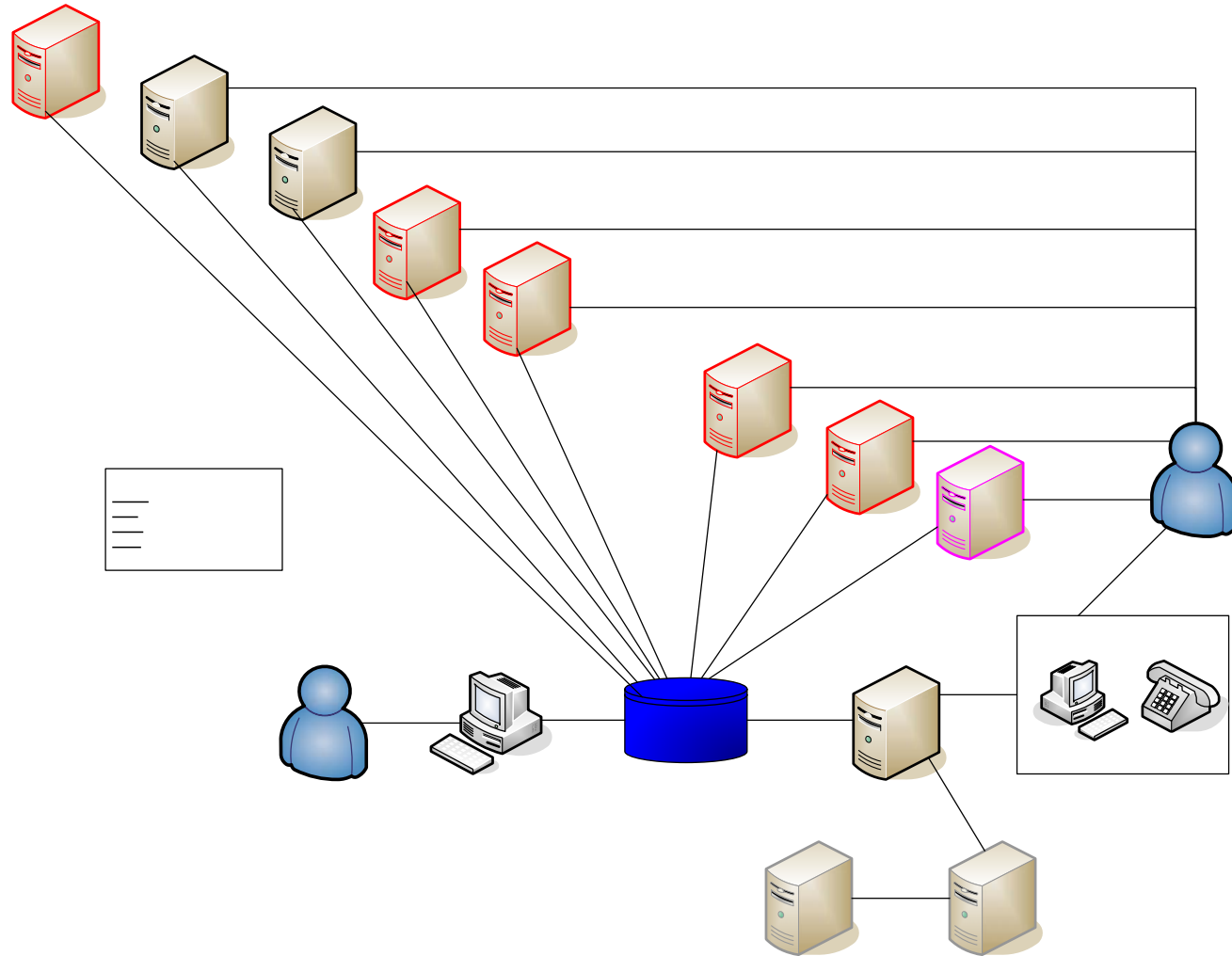
Wi



Based on the architectural analysis that focused on functional overlaps between legacy systems, it is recommended that legacy systems be retired or interfaced as depicted.



After the modernization activities are completed, the citizen will be provided easier access to Federal recreation information while DOI will have fewer redundant systems.



**American
Whitewater**

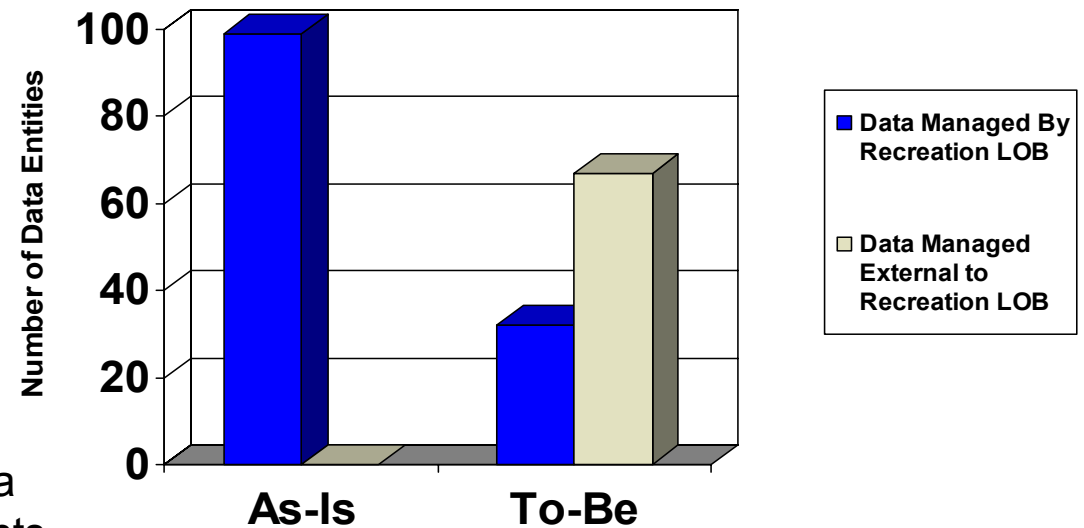
Recreation Blueprint Finding

Finding 4: The data analysis shows that the current Recreation LOB maintains most of its data within the LOB. The future state analysis concludes that 67 of the 99 conceptual data entities should be managed outside of the Recreation LOB.

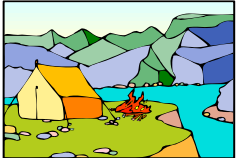
Recommendations:

1. Identify data required by Recreation LOB
2. Identify stewards for required recreation data
3. Standardize required recreation data elements
4. Map standard data to potential source systems
5. Execute investments/system changes to supply data to Recreation LOB

Comparison of Data Stewardship



High Pay Off Data Sharing Opportunities



Recreation



Finance



Law Enforcement



Indian Trust



Fire Management



Facility Management

Organization

Organization

Organization

Organization

Organization

Organization

Location

Location

Location

Location

Location

Location

Facility

Facility

Facility

Facility

Facility

Facility

Other Geospatial
Data Sets

Other Geospatial
Data Sets

Other Geospatial
Data Sets

Other Geospatial
Data Sets

Other Geospatial
Data Sets

Other Geospatial
Data Sets

Person

Person

Person

Person

Person

Person

Alert / Event

Incident/ Alert

Event / Incident

Closure

Equipment

Equipment

Equipment

Equipment

Equipment /
Asset

Natural Resource

Natural Resource

Natural Resource

Natural Resource



Common data needs among differing business lines – pay off is with development and reuse of standard data to meet the business needs

Priority GIS Layer Commonality Across LOBs (cont.)

Geo-spatial Data Themes	FIRE	LAW	RECREATION	FINANCE
Geopolitical Boundaries	X	X	X	
Geographic Names (search and map display and map outputs)	X	X	X	
Hazardous Materials locations	X	X	X	
High resolution imagery (areas of concentrated facilities or special interests)	X	X	X	
Incident Data	X	X	X	X
Jurisdiction Boundaries	X	X	X	
Lakes	X	X	X	
Landmarks Data	X	X	X	
Landsat Imagery	X	X	X	
Lightning Data	X			
Modis Imagery	X			



Priority GIS Layers Common Across LOBs

Geo-spatial Data Themes	FIRE	LAW	RECREATION	FINANCE
Activities			X	
Burned Areas	X			
Business and Home Locations	X	X		
Cultural Heritage Information	X	X	X	
Digital Elevation Models	X			
Drought Condition data	X			
Facilities	X	X	X	X
Fire Perimeters	X			
Fuels Data	X			



Priority GIS Layer Commonality Across LOBs (cont.)

Geo-spatial Data Themes	FIRE	LAW	RECREATION	FINANCE
Organizational Responsibilities Areas	X	X	X	X
Organizational Responsibilities Areas	X	X	X	X
Ownerships (Federal)	X	X	X	X
Ownerships (Federal)	X	X	X	

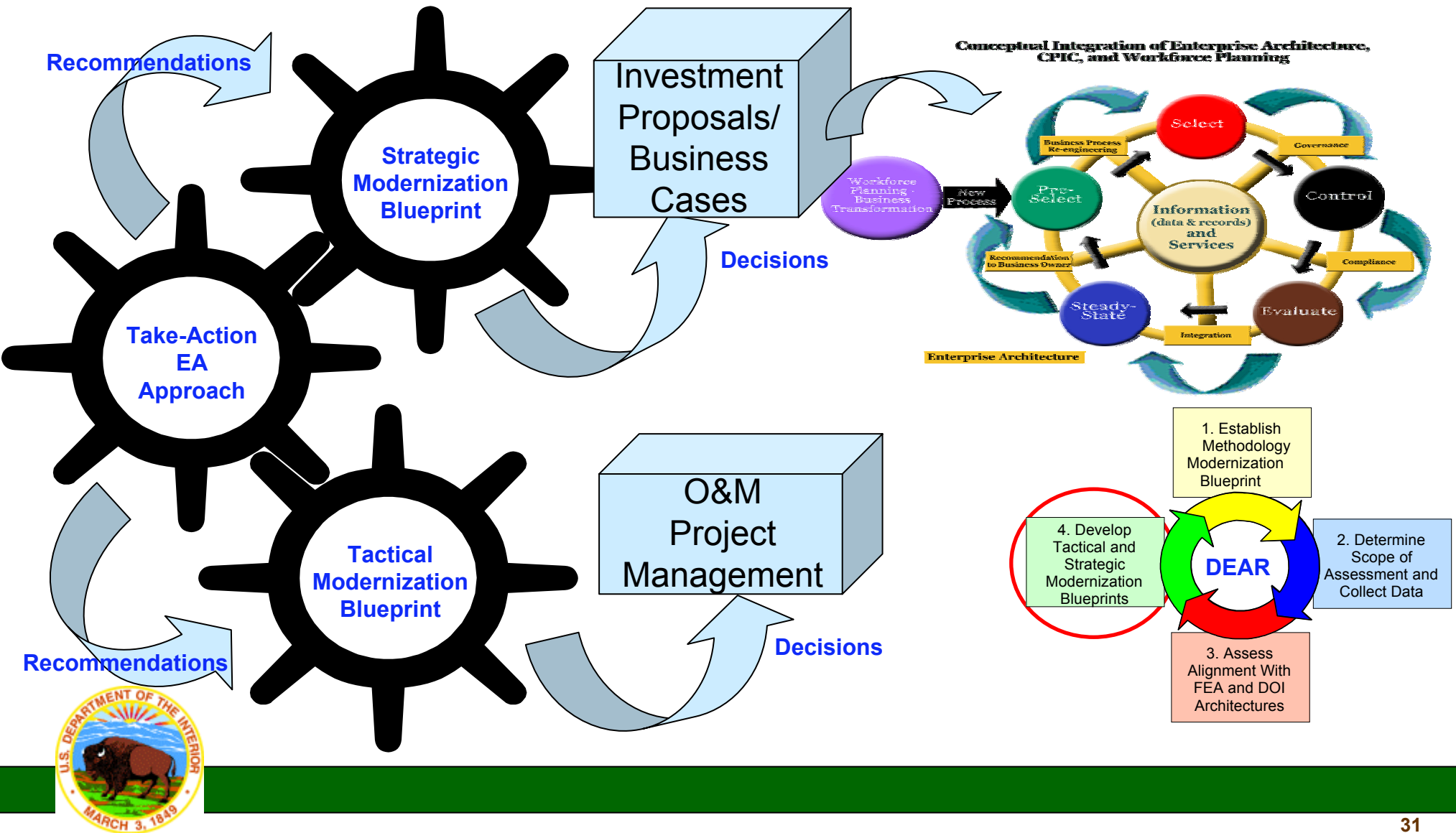


PARTNERSHIP BETWEEN E-GIS COMMUNITY & IEA

- ▶ **Modernization Blueprints are Identifying Priority GIS Layers that can be Leveraged by Multiple Lines of Businesses**
- ▶ **DEAR identifies Current DOI Systems that House Priority Data Sets.**
- ▶ **IEA (Data Architecture Program) Partner with E-GIS Community via E-GIM Business Case to:**
 - **Establish Data Stewards for Priority Data Sets**
 - **Establish/Adopt DOI/FGDC Data Standards**
 - **Identify Candidate Authoritative Data Sources**
 - **Develop Blueprints for Exchanging Standardized Data via XML for Multiple LOBs.**
 - **Establish Transition Plans for DOI-Wide Data Sharing.**
- ▶ **Establish DOI-Wide Application/Data Integration Solution Architecture**



4. Develop Tactical and Strategic Modernization Blueprints





The End

IEA Summit Week of September 14 – 16, 2004
Albuquerque, NM



Enterprise Access Control Services/AD

- ▶ Leveraging the DOI Active Directory Project and BLM's e-Authentication Efforts
- ▶ Office of the Secretary (immediate staff) Converted to Microsoft Active Directory by March **(completed)**
- ▶ Reducing Hundreds of Varying Access Control Methods
- ▶ Reducing Complexity While Improving Security Readiness
- ▶ Integrating Physical and Logical Access
 - Smart Cards
 - Public Key Infrastructure (PKI) GPEA
 - Multi-Factor Authentication



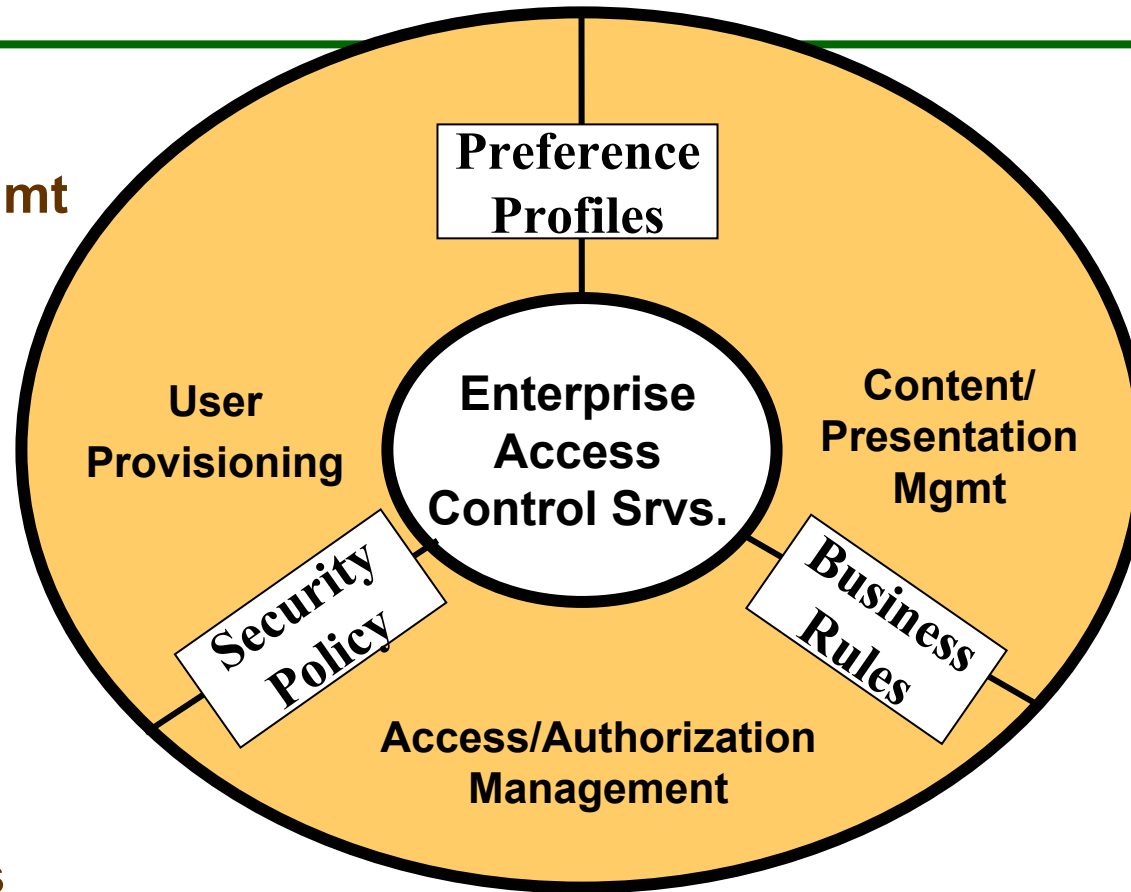
EACS is Integral to DOI-wide E-Government Initiatives

- Workflow
- Password Mgmt
- Roles

- Portals (FBMS)
- Apps Servers
- Operating Systems

DOI Internal
Facing
Access &
Transactions

DOI External
Facing
Access &
Transactions



PKI, Smart Cards, Biometrics....

Source: Gartner (modified)





Enterprise Architecture In Action

**Preliminary Modernization Blueprint
Findings: Recreation Case Example**

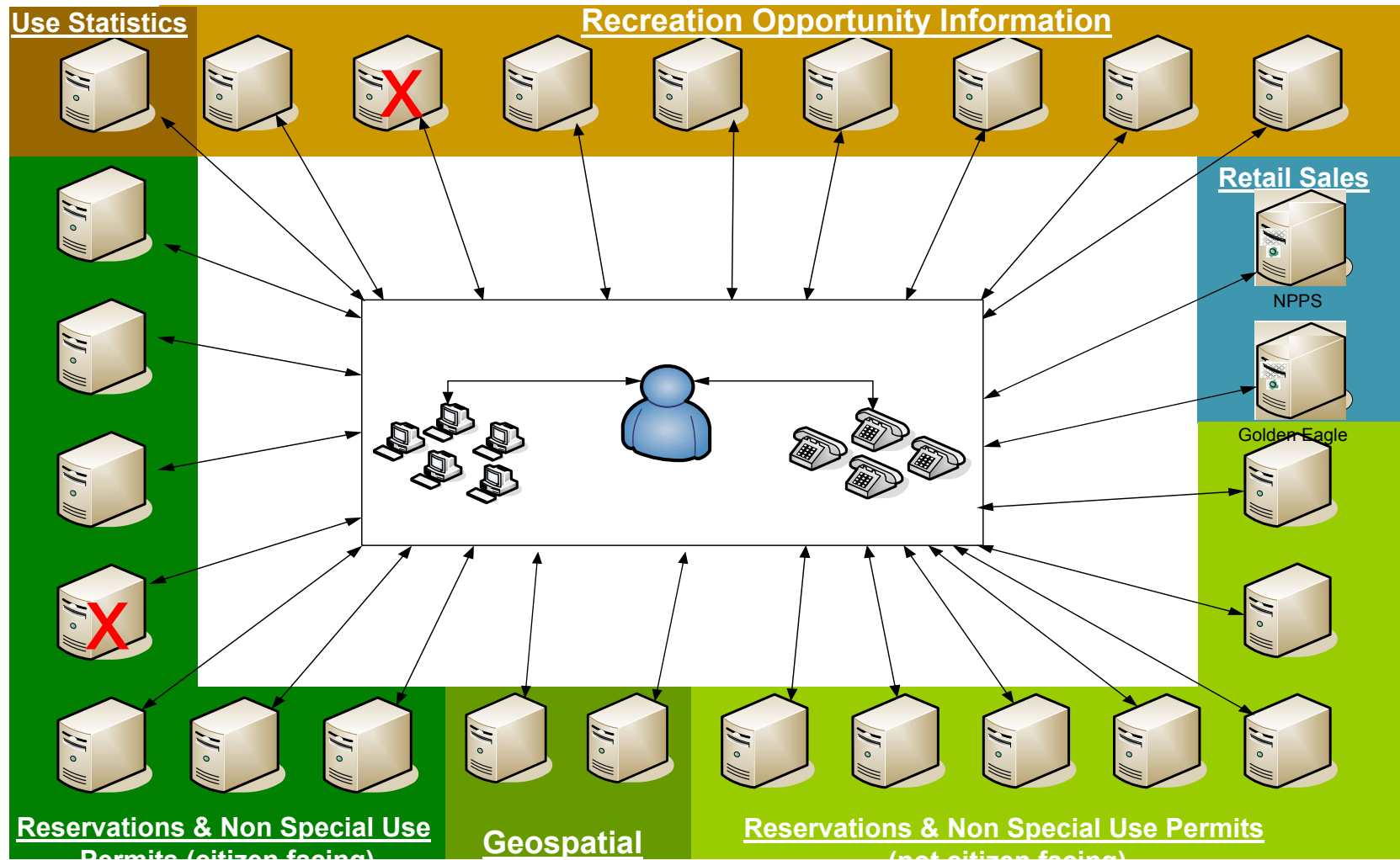


DOI Modernization Blueprints – In Progress

- ▶ **Recreation -**
 - Realizing the Vision of Recreation One Stop (RIS) through Cross-Cutting Inter-Agency Solutions
- ▶ **Wildland Fire**
 - Improving Mission Performance, Information Quality and Delivery and Cross-Cutting Inter-Agency Solutions
- ▶ **Financial & Grants Management**
 - Supporting the Deployment of a DOI-Wide Solution and Participating in the Development of a Federal-wide LOB Solution. DOI is Co-lead on EA team for Financial Management.
- ▶ **Law Enforcement**
 - Improving Mission Performance, Information Quality and Delivery, and Cross-Cutting Inter-Agency Solutions.



Current recreation customers are faced with too many sources for Federal recreation information.



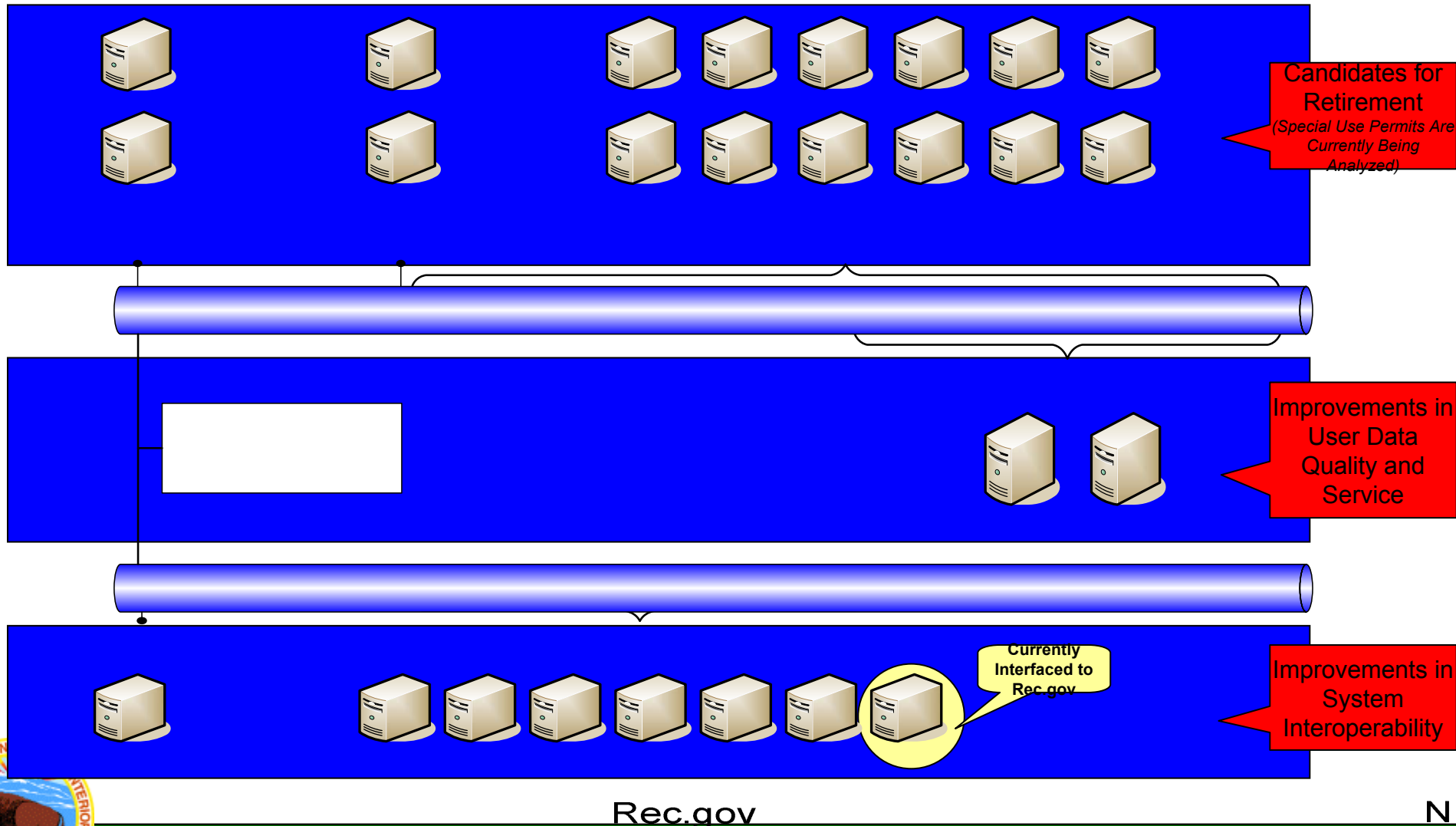
Recreation FY06 Preliminary Findings

- ▶ **Finding: R1S currently slated to retire 2 DOI-funded systems. Other DOI systems exist that maintain separate inventories of reservable recreation objects (e.g., campgrounds, pavilions and river access reservations).**
 - *Implication: Although R1S results in significant improvements, the citizen will still have multiple interfaces to reserve Federally-funded recreation opportunities if these separate inventories are not folded into the R1S Information Database (R1DB) resulting in sub-optimal cost savings.*

- ▶ **Finding: Recreation LOB has requirement to interface with authoritative data sources (e.g., GIS data for facility location, trails, rivers, mapping services, etc.) outside its functional purview.**
 - *Implication: Requirement exists to identify DOI-wide data steward community for applicable GIS resource/reference layers, develop data standards, and designate authoritative data source(s) for information sharing through common interfaces.*



Based on functional overlaps, it is recommended that legacy systems be retired or interfaced as depicted.



I

Conclusion



OMB EA ASSESSMENT FRAMEWORK

DOI's EA Program Addresses the Four Key Components of Assessment Framework

► Change

- Modernization Blueprint Analysis Facilitates Common Solution(s) by documenting As-Is, defining Target and developing associated Transition Plan.

► Integration

- Improves data sharing through standardized data, Identifies reusable components, and defines Target Architectures with associated transition plans



OMB EA ASSESSMENT FRAMEWORK

DOI's EA Program Addresses the Four Key Components of Assessment Framework

► Convergence

- DOI TRM unifies and simplifies by standardizing IT technologies and products. DOI IT initiatives (e.g., ESN, EACS) provide foundation for deploying Business-driven Architectures.

► Business Alignment

- IT Portfolios are analyzed against Strategic Outcomes & Measures. Modernization Blueprint Recommendations are presented to Investment Review Board for approval in guiding CPIC decisions.

